PETROGRAPHY AND PETROLOGY OF THE METASEDIMENTARY ROCKS IN THE EAST KILLINGLY QUADRANGLE, CONNECTICUT AND RHODE ISLAND

A thesis submitted as partial fulfillment of the requirements for a Bachelor of Science degree in Geology and Mineralogy at The Ohio State University

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TABLE OF CONTENTS

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Introduction

The East Killingly quadrangle lies along the border of Connecticut and Rhode Island, between 41°45' and 41°52'30" N. latitude, and 71°47' and 71°52'30" W. longitude. The quadrangle, as is most of New England, is in the middle of the Appalachian mountain system, which extends from southern Alabama through Newfoundland.

George E. Moore has mapped the quadrangle and is currently preparing the data for publication.

General Description of the Area and Stratigraphy

A major portion of the East Killingly quadrangle consists of meta-igneous rocks of the Sterling Plutonic Group. Included in this group are the Ponagansett Gneiss, Scituate Granite Gneiss, Hope Valley Alaskite Gneiss, and the Ten Rod Granite Gneiss. In the western half of the quadrangle there are metasedimentary rocks of the Plainfield Formation (Moore, 1979).

The plutonic formations seem to be the result of a single prolonged episode of plutonic activity that formed a complex batholith. The age of these rocks is uncertain. They are at least as old as Pennsylvanian because they lie unconformably underneath rocks of Pennsylvanian age in the Narragansett Basin. Recent estimates have called them Devonian (?) (Moore, oral commun.).

The Plainfield Formation has been divided into three major members. These are a lower quartzite, an overlying schist, and an upper quartzite.

The upper and lower quartzite members consist of a fairly massive quartzite that contains quartz, minor oligoclase, muscovite, biotite, and microcline, and traces of zircon and tourmaline. The rocks commonly are weakly foliated. The quartz is slightly elongate, strained, and averages 0.5 to 0.6 mm. Oligoclase and microcline, both

twinned and untwinned, exist as subhedral 0.3 to 0.4 mm grains. Much of the oligoclase shows alteration to sericite. Muscovite and biotite occur as elongate flakes that are parallel to the foliation and lineation, and average 0.3 mm in length. Well rounded zircon and subhedral tourmaline average 0.1 mm.

The schist member is irregularly foliated, medium-grained, and consists of quartz, epidote, oligoclase, muscovite, biotite, and calcite. Some specimens also contain tremolite, microcline, and minor sphene, magnetite, zircon, and tourmaline. The quartz is elongate, strained, ranges from 0.1 to 1.0 mm, and occurs as pods, flattened lenses, and bands. Epidote and tremolite both range from 0.1 to 1.0 mm and occur as aggregates and individual grains. Oligoclase and microcline are uniformly distributed and average 0.3 mm. Lineation is commonly produced by elongate flakes of biotite and muscovite that average 0.5 mm and form bands and clusters. Interstitial calcite occurs in some specimens and averages 0.6 mm.

The intrusive nature of the contact between the Ponagansett Gneiss of the Sterling Plutonic Group and the lower quartzite member of the Plainfield Formation indicates that these metasedimentary rocks are at least as old as Devonian (?). In fact, the Plainfield Formation is now thought to be Cambrian (?) (Harwood and Goldsmith, 1971).

The minimum thickness of the Plainfield Formation has been estimated at 1000' in the Oneco quadrangle, which lies directly south of the East Killingly quadrangle (Harwood and Goldsmith, 1971). An accurate thickness in the East Killingly quadrangle cannot be determined due to the intense small scale folding that has occured. The estimate of 1000' is necessarily a minimum figure because of the intrusive nature of the contact between the lower quartzite and the Ponagansett Gneiss.

Structural Geology

The Plainfield Formation strikes generally north and dips 20^{o} to 30^{o} west. These rocks are therefore on the west limb of an anticline. In places the foliation in these metasedimentary rocks is parallel to the bedding. The schist member shows intense small-scale folding. The quartzite members lack these folds, demonstrating the fact that they were probably more competent than the schist. Many of these rocks have a lineation that strikes northeast and dips northwest. This lineation is produced by the arrangement of the elongate micas.

The plutonic rocks make up one magmatic series that forms a batholith (Quinn, 1971). These rocks intruded

the metasedimentary rocks, creating sills and dikes, stocks, and thick sheets within the Plainfield Formation. Within the meta-igneous formations there are two foliations. One of these strikes north and dips west, the other later foliation strikes westerly and dips to the north. The first foliation, which may be a primary flow structure, is strongly developed and indicates that the intrusion was syntectonic (Quinn, 1971). The second foliation is weaker, and is evidence for post-intrusive metamorphism.

Parent Rocks and Metamorphism

The sedimentary rocks of the Plainfield Formation have been subjected to middle-grade regional metamorphism.

The parent rocks may have originated from miogeosynclinal sediments. The upper and lower quartzite members are probably products of metamorphosed impure sandstones. The schist member could have been derived from a shale that was locally very calcareous.

At least three pre-pennsylvanian episodes of metamorphism are indicated in this area (Moore, 1963). The meta-igneous rocks of the Sterling Plutonic Group show two distinct foliations. One of these foliations is probably due to the syntectonic nature of the intrusion. The other folia-

tion is a younger one, indicating a post-intrusive episode of metamorphism. Inclusions of the foliated Cambrian (?) metasedimentary rocks have been found within the intrusives. These inclusions have been rotated with respect to either of the two foliations in the meta-igneous rocks. This is evidence for the existence of yet a third period of metamorphism that took place prior to the Devonian (?) intrusion of the Sterling Plutonic Group.

MODAL ANALYSIS OF THE SCHIST SPECIMENS

(volume percent)

SPECIMEN	EK-36A	EK-45A	EK-77A	EK-80D *	EK-182C **	EK-189B *	EK-193B	EK-207B	EK-210B
QUARTZ	68	79	35	34.8	30	62.4	35	50	47
TREMOLITE	2.3	-	-	22.2	-	-	-	-	-
EPIDOTE	-	-	-	-	8	18.6	15	17	10
OLIGOCLASE	5	-	24	15.6	30	-	-	-	16
MUSCOVITE	16	-	20	7.4	-	10.8	20	19	3
CALCITE	-	6	-	14.6	-	2.8	10	-	7
BIOTITE	4	11	15	4.6	11	2.6	5	8	10
MICROCLINE	2	-	-	-	20	2.2	14.8	1.5	7
SPHENE	-	-	-	0.4	-	0.4	-	1	-
MAGNETITE	2.5	-	-	0.4	-	0.2	0.2	0.5	-
TOURMALINE	0.2	-	5	-	-	-	-	-	-
ALBITE	-	3	-	-	-	-	-	-	-
PYRITE	-	0.5	-	-	-	-	-	-	-
SERICITE	-	0.5	-	-	-	-	-	-	-
ZIRCON	-	-	0.6	-	-	-	-	-	-
HEMATITE	-	-	0.4	-	-	-	-	-	-
ALLANITE	-	-	-	-	1	-	-	-	-
CHLORITE	-	-	-	-	-	-	-	3	-

* Point-counts made; others estimated.
** granite.

MODAL ANALYSIS OF THE QUARTZITE SPECIMENS

(volume percent)

SPECIMEN	EK-278	EK-34C	EK-42A	EK-170C	EK-170E	EK-178B	EK-211D
QUARTZ	76	75	70	65	72	73	80
BIOTITE	8	-	10	15	14	10	5
OLIGOCASE	7.8	2	10	17	10	-	9.8
TREMOLITE	7	-	-	-	-	-	-
MUSCOVITE	-	8	5	2.8	-	5	5
MICROCLINE	-	13	4.5	-	-	10	-
CHLORITE	1	-	-	-	-	-	-
ZIRCON	0.1	-	-	0.2	-	1	-
SERICITE	0.1	-	0.5	-	0.3	-	-
GARNET	-	0.3	-	-	0.4	-	-
PYRITE	-	0.2	-	-	-	-	-
LIMONITE	-	1.3	-	-	-	-	-
HEMATITE	-	0.2	-	-	-	-	-
CALCITE	-	-	-	-	3	-	-
TOURMALINE	-	-	-	-	0.3	1	0.2

Specimen EK-27B

General Locality:

On the east side of the 630' hill, on the east side of Baily Hill Rd. next north of X636'.

Megascopic:

Light gray medium to fine-grained quartzite. Elongate biotite shows a lineation. Minor chlorite.

Thin Section:

Quartz is slightly elongate and is parallel, giving the rocks a weak foliation. Elongate flakes of biotite and small crystals of tremolite are both parallel to the foliation. Oligoclase occurs, along with minor chlorite and zircon.

Mineral Description:

Quartz (76%) - Subhedral grains are slightly elongate and average 0.5 mm.

Biotite (8%) - Elongate flakes are 0.25 to 0.5 mm long, parallel to the foliation and lineation, and contain some pleochroic halos.

Oligoclase (7.8%) - Subhedral, 0.3 mm, somewhat altered to sericite.

Tremolite (7%) - Very small euhedral crystals are $<$ 0.1 mm long and are parallel to the foliation.

Chlorite (1%) - Small flakes average 0.1 to 0.2 mm.

Accessories (0.2%) - Zircon - small, well-rounded.

Sericite - alteration of oligoclase.

Specimen EK-34C

General Locality:

Near the northwest corner of the mill building, south of East Killingly.

Megascopic:

Yellowish-brown to gray medium-grained quartzite. Weak foliation. Elongate muscovite shows a weak lineation. Yellow-brown limonite stain probably results from the weathering of pyrite, some of which is still present.

Thin Section:

Size of quartz is variable. Small muscovite flakes are uniformly distributed. Microcline occurs as does minor oligoclase. Limonite staining is common. Minor pyrite has hematite rims. Garnet is rare.

Mineral Description:

Quartz (75%) - Subangular grains range from 0.1 to 1.0 mm.

Microcline (13%) - Subhedral, uniformly distributed, tartan twinned, and 0.2 to 0.5 mm.

Muscovite (8%) - Elongate flakes are 0.1 to 0.2 mm long and are sub-parallel.

Oligoclase (2%) - Albite-twinned grains are 0.2 to 0.5 mm across.

Accessories (2%) - Limonite - Orange-yellow stain throughout the slide fills interstices between grains.

Pyrite - Small euhedral cubes.

Hematite - Forms rims around the pyrite.

Garnet - 0.5 - 1.0 mm in diameter.

Specimen EK-36A

General Locality:

Elevation 490' on the south edge of the tiny 500' knob 0.5 miles north-northeast of the intersection of Slater Hill and Burlingame Roads.

Megascopic:

Whitish-gray medium-grained quartz-muscovite schist that shows irregular foliation. Lineation results from parallel orientation of elongate muscovite and minor biotite. Bands of medium-grained quartz are common.

Thin Section:

Irregularly shaped quartz shows undulatory extinction and is slightly elongate. Sinuous bands containing muscovite, oligoclase, tremolite-actinolite, biotite, magnetite, microcline, tourmaline, and small quartz grains, are intercalated with layers of medium-grained quartz.

Mineral Description:

Quartz (68%) - Strained, slightly elongate, irregularly edged, ranges up to 2.0 mm. Averages 0.1 mm within the bands.

Muscovite (16%) - Small elongate flakes are 0.1 to 0.5 mm long, parallel, and occur exclusively within the bands.

Oligoclase (5%) - Subhedral grains limited to the bands.

Ranges from 0.1 mm to 1.0 mm. Most is albite twinned.

Biotite (4%) - 0.1 to 1.0 mm long flakes occur within the bands.

Magnetite (2.5%) - 0.1 to 0.3 mm, mostly within the bands.

Tremolite-Actinolite (2.3%) - Clusters of equidimensional grains are 0.3 to 0.5 mm in diameter.

Microcline (2%) - Within the bands, subhedral, averages 0.4 to 0.5 mm, tartan twinned.

Accessories (0.2%) - Tournamline - 0.1 mm grains.

Specimen EK-42A

General Locality:

On the little 720' knob along west side of Cooma Hill Rd. just north of Bailey Hill Rd.

Megascopic:

Whitish-gray medium to fine-grained quartzite with streaks of biotite and minor muscovite that give a weak lineation.

Thin Section:

Mostly equidimensional quartz with sub-parallel elongate flakes of biotite and muscovite. Oligoclase shows alteration to sericite. Minor microcline.

Mineral Description:

Quartz (70%) - Subhedral to anhedral equidimensional grains average 0.3 to 0.5 mm.

Biotite (10%) - Small elongate flakes are sub-parallel and average 0.1 mm.

Oligoclase (10%) - Subhedral grains are 0.2 mm and show alteration to sericite.

Muscovite (5%) - Elongate sub-parallel flakes are 0.2 mm long.

Microcline (4.5%) - Subhedral, averages 0.3 mm.

Accessories (0.5%) - Sericite - minute flakes as a result of oligoclase weathering.

Specimen EK-45A

General Locality:

On the 410' knob east of Half Hill Bk., and 150' north of Route 6 on the new road.

Megascopic:

Silver-gray medium-grained quartz-biotite schist that shows strong foliation with band of quartz up to 15.0 mm thick. Biotite is common, and calcite occurs in streaks.

Thin Section:

Elongate strained quartz grains are parallel. Several bands occur that contain elongate flakes of biotite, albite, fine quartz and pyrite. Streaks of calcite are present throughout.

Mineral Description:

Quartz (79%) - Elongate grains vary in length up to 2.0 mm and show undulatory extinction.

Biotite (11%) - Flakes are up to 1.0 mm long, and are clustered within the bands.

Calcite (6%) - Subhedral to anhedral, up to 1.5 mm. Some grains show good cleavage cracks.

Albite (3%) - 0.3 to 0.4 mm grains are contained within the bands and show some alteration to sericite.

Accessories (1%) - Pyrite - Small grains are limited to the bands.

Sericite - Alteration product of albite.

Specimen EK-77A

General Locality:

1000' north of the corner of Snake Meadow and Olearus Hill Rds.

Megascopic:

Silver-gray medium-grained quartz-plagioclase-muscovite-biotite schist with well-developed irregular foliation. Weathered in some places to a yellow-brown. Parallel elongate muscovite and biotite give the rock a lineation.

Thin Section:

Elongate quartz mixed with oligoclase. Muscovite and biotite occur in bands. Minor tourmaline is uniformly distributed. Hematite staining, and minor zircon.

Mineral Description:

Quartz (35%) - Anhedral, slightly elongate, and 0.1 to 1.0 mm.

Oligoclase (24%) - Subhedral, mixed throughout the quartz, up to 0.75 mm.

Muscovite (20%) - 0.25 to 1.0 mm long flakes are in clusters with biotite, and are sub-parallel.

Biotite (15%) - Some flakes in clusters, others are scattered throughout. Sub-parallel, and range from 0.1 mm to 1.0 mm in length.

Tourmaline (5%) - Prismatic sections up to 0.75 mm long. Optic axis sections are 0.1 to 0.2 mm in diameter.

Accessories (1%) - Zircon - Well-rounded, 0.1 mm in diameter.

Hematite - Red-brown stain.

Specimen EK-80D

General Locality:

Elevation 490' ± on the spur 2300' north of edge of quadrangle, west of Olearus Hill Rd.

Megascopic:

Blue-gray medium to fine-grained quartz-tremolite-plagioclase calcite-muscovite schist. Parallel muscovite gives a lineation. Streaks of calcite occur. The rock shows a foliation.

Thin Section:

Fine-grained quartz is scattered throughout, except for a band of quartz that is coarse-grained. Calcite and tremolite are common. Oligoclase is somewhat altered to sericite, and is blended throughout the slide. Muscovite flakes are sub-parallel. The biotite occurs in a thin band. Minor sphene.

Mineral Description:

Quartz (34.8%) - Anhedral grains are 0.1 mm except for a band that contains 1.0 mm grains. Undulatory extinction is prominent.

Tremolite (22.2%) - Anhedral grains are 0.5 to 1.0 mm long. Uniformly distributed, rarely in aggregates.

Oligoclase (15.6%) - Subhedral to anhedral grains are 0.2 to 0.3 mm in size and are untwinned.

Calcite (14.6%) - Anhedral, 0.3 to 0.5 mm across.

Muscovite (7.4%) - Flakes are 1.0 to 2.0 mm long and are oriented parallel to each other, denoting a lineation.

Biotite (4.6%) - Most flakes are 0.3 to 0.5 mm long and occur in a single thin band that runs parallel to the foliation.

Accessories (0.8%) - Sphene - Euhedral to anhedral, averages 0.6 mm in length.

Magnetite - 0.1 to 0.1 mm.

Specimen EK-170C

General Locality:

On the big 620' spur on the south end of Bear Hill.

Megascopic:

Whitish-gray fine-grained quartzite that is weakly foliated. Biotite and minor muscovite from streaks. Weak lineation.

Thin Section:

Quartz is slightly elongate and sub-parallel. Elongate biotite and muscovite are parallel to the foliation and lineation. Oligoclase is common, somewhat altered to sericite. Minor zircon.

Mineral Description:

Quartz (65%) - Anhedral grains range from 0.1 to 1.0 mm. Prominent undulatory extinction. Slightly elongate and sub-parallel.

Oligoclase (17%) - Uniformly distributed subhedral to anhedral grains are 0.3 to 0.4 mm in size, and slightly altered.

Biotite (15%) - Elongate flakes range from 0.2 mm to 1.0 mm in length, and are parallel to the weak foliation and lineation.

Muscovite (2.8%) - Parallel to the biotite, and averages 0.2 mm.

Accessories (0.2%) - Zircon - Very small, rounded.

Specimen EK-170E

General Locality:

Elevation 520' on spur to the south of EK-170C.

Megascopic:

Light tan fine-grained clean quartzite that is weakly foliated and shows minor biotite. Weakly lineated.

Thin Section:

Quartz is elongate and shows undulatory extinction. Oligoclase is common and somewhat altered to sericite. Elongate biotite is parallel to foliation and lineation. Calcite is interstitial. Minor zircon and tourmaline.

Mineral Description:

Quartz (72%) - Slightly elongate grains range from 0.1 mm to 1.0 mm in length.

Biotite (14%) - Elongate flakes range from 0.1 to 0.3 mm.

Oligoclase (10%) - Subhedral to anhedral, averages 0.2 mm, untwinned, and somewhat altered.

Calcite (3%) - Anhedral, averages 0.2 mm, intersitial.

Accessories (1%) - Tourmaline - 0.1 mm.
Zircon - Rounded, 0.1 mm.
Sericite - alteration product of oligoclase.

Specimen EK-178B

General Locality:

East of Ballouville at the quarry, el. 540'-560', on the north-west end of the 582' hill.

Megascopic:

Whitish-gray medium to fine-grained massive quartzite. Biotite occurs in streaks, giving a weak foliation to the rock.

Thin Section:

Predominantly quartz grains that show a slight elongation. Elongate flakes of biotite and muscovite occur uniformly throughout and are parallel to the weak elongation of the quartz. Microcline occurs throughout, as do small grains of zircon and tourmaline.

Mineral Description:

Quartz (73%) - Anhedral, slightly elongate grains are 0.2 to 0.6 mm long and show mild straining.

Biotite (10%) - Small parallel widely-scattered flakes average 0.3 mm in length.

Microcline (10%) - Subhedral to anhedral untwinned, 0.3 to 0.4 mm. Grains contain minute inclusions.

Muscovite (5%) - Similar to the biotite, with flakes 0.2 to 0.3 mm long.

Accessories (2%) - Zircon - Well rounded grains average 0.1 mm in diameter.

Tourmaline - Subhedral to anhedral, 0.1 to 0.2 mm long.

Specimen EK-182C

General Locality:

Elevation 645' ± just east of the 650' spur near Breakneck Hill.

Megascopic:

Whitish-gray medium to fine-grained granite containing quartz, feldspar, and biotite. This sill within the upper quartzite has two foliations. One is produced by the elongate quartz and feldspar. The other results from oriented elongate flakes of biotite.

Thin Section:

Elongate quartz, oligoclase, and microcline are common and produce a foliation. Elongate biotite produces a second foliation. Epidote surrounds allanite crystals, and also occurs individually.

Mineral Description:

Quartz (30%) - Anhedral, 0.1 to 1.0 mm in size, slightly elongate.

Oligoclase (30%) - Subhedral, 0.1 to 0.3 mm. Albite twinned in some cases.

Microcline (20%) - Subhedral, mostly untwinned, 0.3 to 0.5 mm.

Biotite (11%) - Elongate flakes that occur in bands and as

individuals, average 0.5 mm in length. Parallel orientation gives a second foliation to the rock.

Epidote (8%) - 0.1 to 0.2 mm grains occur individually, and as aggregates around allanite.

Accessories (1%) - Allanite - Euhedral crystals are 0.5 to 1.0 mm long, show zoning, and are twinned.

Specimen EK-189B

General Locality:

South of Chase Reservoir in a road cut across from the 450' knob.

Megascopic:

Greenish silver-gray medium-grained quartz-epidote-muscovite schist. Weakly foliated and strongly lineated from parallel orientation of the elongate flakes of muscovite and minor biotite. Some of the quartz grains form flattened lenses.

Thin Section:

Most minerals are uniformly distributed except for the flattened lenses of quartz. Foliation is weak. Quartz, muscovite, calcite, and biotite predominate. The epidote forms fine-grained aggregates in some areas. Minor microcline, sphene, and magnetite.

Mineral Description:

Quartz (62.4%) - Anhedral grains are very slightly elongate, and range from 0.2 to 0.75 mm across. The different grain sizes are distributed equally throughout. Slight undulatory extinction.

Epidote (18.6%) - Sub-angular grains average 0.1 mm in size, evenly distributed.

Muscovite (10.8%) - Flakes average 0.4 to 0.5 mm in length, are parallel to each other, and occur in groups.

Calcite (2.8%) - Anhedral grains average 0.6 to 0.7 mm in size.

Biotite (2.6%) - Most flakes are 0.2 to 0.3 mm long parallel to the lineation.

Microcline (2.2%) - Subhedral grains average 0.3 mm across.

Accessories (0.6%) - Sphene - Subhedral to anhedral, average 0.5 mm across.

Magnetite - averages 0.1 to 0.2 mm.

Specimen EK-193B

General Locality:

Along Pratt Rd., elevation 450', just west of the northwest arm of Chase Reservoir.

Megascopic:

Greenish-gray medium grained quartz-muscovite-epidote-calcite schist. Irregular foliation is interrupted by aggregates of quartz. Pink calcite occurs in streaks. Lineation shown by parallel elongate muscovite and minor biotite.

Thin Section:

The grain size of the quartz is variable. Elongate flakes of muscovite are parallel and join aggregates. Epidote is common, occuring in uniformly distributed clusters. Calcite grains are interlocking. Biotite flakes are elongate and parallel to the lineation. Microcline occurs thoughout. Minor magnetite.

Mineral Description:

Quartz (35%) - Equidimensional grains range from 0.1 to 1.0 mm in size.

Muscovite (19%) - Flakes that are 0.2 to 0.6 mm long form aggregates that make the sinuous foliation highly visible.

Epidote (17%) - Most grains are less than 0.1 mm across and occur in granular aggregates. Some grains as large as 0.3 mm in size.

Biotite (8%) - Flakes are in aggregates, and average 0.5 mm in length.

Chlorite (3%) - Most flakes are adjacent to, or close to the biotite, and average 0.3-0.5 mm in length.

Accessories (3%) - Microcline - Subhedral, averages 0.2 mm across.

Sphene - Subhedral, 0.2 to 0.3 mm.

Tourmaline - 0.1 mm grains.

Specimen EK-210B

General Locality:

South-east of Tetrault Pond and east of Hubbard Hill Rd. 300' south of end of outcrop.

Megascopic:

Grayish-tan medium-grained quartz-plagioclase-biotite-epidote schist or schistose quartzite that is foliated. Potassium feldspar and plagioclase form streaks. Calcite in minor amounts. Weak lineation from elongate biotite.

Thin Section:

Quartz, microcline, and oligoclase prevail. Calcite is spread throughout as is epidote. A band containing large grains of quartz cuts across the slide. Elongate flakes of biotite and minor muscovite are parallel to the foliation and lineation.

Mineral Description:

Quartz (47%) - Equidimensional, subangular, and 0.2-0.3 mm in diameter. Up to 1.0-1.5 mm in the course-grained band.

Oligoclase (16%) - Sub-angular, 0.4 to 0.5 mm, and altered to sericite.

Biotite (10%) - Scattered elongate parallel flakes are 0.5-0.75 mm long.

Epidote (10%) - Most grains are 0.1 to 0.2 mm across and occur in granular aggregates. Some grains as large as 0.75 mm in size.

Calcite (7%) - Irregularly shaped, and 0.5 mm. Uniformly distributed.

Microcline (7%) - Subhedral grains show tartan twinning and average 0.3 to 0.5 mm.

Muscovite (3%) - Small elongate flakes are 0.1 to 0.2 mm long.

Specimen EK-211D

General Locality:

Near the top of the steep face due east of the house near Hubbard Hill Rd.

Megascopic:

Grayish-tan medium to fine-grained quartzite with a weak foliation. Muscovite and biotite flakes are elongate and form a lineation.

Thin Section:

The quartz is of uniform size and shape and is slightly elongate. Muscovite and biotite flakes are uniformly distributed. Oligoclase is common.

Mineral Description:

Quartz (80%) - Slight elongation of irregular grains that are 0.25 to 0.5 mm long.

Biotite (5%) - Small elongate flakes are 0.1 to 0.2 mm long.

Muscovite (5%) - Longer than biotite, averaging 0.5 mm in length.

Oligoclase (9.8%) - Distributed throughout, 0.3 mm in size.

Accessories (0.2%) - Tourmaline - Subhedral grains are 0.1-0.2 mm.

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